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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,650	05/09/2006	Reinhold Elferich	DE 030387	1792
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/578,650

**Applicant(s)**

ELFERICH ET AL.

**Examiner**

Ephrem Alemu

**Art Unit**

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 4-13 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-13 and 17-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Allowable Subject Matter***

1. The indicated allowability of claims 8-10 and 12-13 are withdrawn in view of the newly discovered references of Pong et al. (US Pub. 2003/0112229) and Elferich (US Pub. 2002/0186026). Rejections based on the newly cited references follow.

### ***Drawings***

2. Upon further reconsideration, the drawings submitted on 05/09/2006 are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, “the variable duty cycle of the at least one control signal is based at least in part on at least one of a first feedback signal associated with the at least one first light source and a second feedback signal associated with the at least one second light source” as recited in lines 16-18 of claim 17; and “the first feedback signal and the second feedback signal are optical signals” as recited in lines 1 and 2 of claim 18 must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the

renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re Claims 12 and 13, lines 3 and 3, respectively, "the further LED" lacks antecedent basis. Is "the further LED" refers to "the first of the two LEDs or two groups of LEDs" or "the second of the two LEDs or two groups of LEDs" or "different from the two LEDs or two groups of LEDs or subsidiary light source LEDs? Appropriate correction and/or clarification are required.

For the purpose of examination, "the further LED" has been interpreted to read on either "the first of the two LEDs or two groups of LEDs" or "the second of the two LEDs or two groups of LEDs"

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Pong et al. (US Pub. 2003/0112229).

Re claim 24, discloses an apparatus (Fig. 15), comprising:

at least one first light source (320, 325) coupled to at least one secondary winding (310, 315) of a transformer (300) so as to conduct a first secondary current (via light source 320) and thereby generate first light only during a positive half-cycle of a secondary voltage across the at least one secondary winding (310, 315) (Fig. 15);

at least one second light source (320, 325) coupled to the at least one secondary winding (310, 315) so as to conduct a second secondary current (via light source 325) and thereby generate second light only during a negative half-cycle of the secondary voltage (Fig. 15); and

at least one third light source (330) coupled to the at least one secondary winding (320, 325) so as to conduct a third secondary current and thereby generate third light during both the positive half-cycle and negative half-cycle of the secondary voltage (Fig. 15).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pong et al. (U.S. Pub. 2003/0112229).

With respect to claims 25 and 26, although, Pong discloses a first to third different light sources for producing different colors (paragraph [0002]), Pong does not specifically mention the third light source being a white LED or the first light sources being a red and second light source being a blue LED.

However, it is well known in the art to produce many different colors of light by combining two or more different color light emitting diodes.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the first to third light sources with red, blue and white LEDs, respectively, for no other reason than producing different desired colors for many different type lighting application and illumination.

9. Claims 1, 4-13 and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pong et al. (U.S. Pub. 2003/0112229) in view of Elferich (US Pub. 2002/0186026).

With respect to claim 1, Pong discloses LED control apparatus comprising a single converter for the simultaneous, independent brightness and color control of two LEDs or two groups of LEDs (320, 325), which converter is formed substantially from a half or full bridge DC/AC converter with a control unit, and a transformer (300) (Fig. 15; paragraphs [0064] – [0066], [0068]); wherein at least one first LED (320) of the two LEDs or two groups of LEDs (320, 325) conducts a first current only during a positive half-cycle of a secondary voltage across at least one secondary winding (310, 315) of the transformer (300), and at least one second LED of the two LEDs or two groups of LEDs (320, 325) conducts a second current only during a negative half-cycle of the secondary voltage (Fig. 15; paragraphs [0064] – [0066]).

Although, Pong teaches the primary winding (305) of the transformer being driven by half or full bridge power converter or the like (paragraphs [0065] – [0066]), Pong does not show the resonant power converter being a resonant power converter including a resonant capacitor.

Elferich discloses a single resonant power control circuit comprising a resonant capacitor [78] connected at the output of an inverter [54, 56] for the purpose of controlling two output voltages separately (abstract; Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the power converter of Pong with power converter including a resonant capacitor as taught by Elferich for the purpose of producing different voltages to drive different color LEDs using single resonant power converter.

With respect to claim 4, Pong further teaches each of the two LEDs or two groups of LEDs comprises several LEDs joined together into groups (banks) of arrays connected in series or parallel (paragraphs [0028], [0068]).

With respect to claim 5, Pong further discloses that the voltage supply of the two LEDs or two groups of LEDs (320, 325) takes place via the at least one secondary side (310, 315) of the transformer (300) (Fig. 15).

With respect to claim 6, Pong further discloses that the two LEDs or two groups of LEDs (320, 325) are connected to the at least one secondary winding (310, 315) in antiparallel (Fig. 15).

With respect to claim 7, Pong further discloses that the two LEDs or two groups of LEDs (320, 325) are connected to the at least one secondary winding (310, 315) of the transformer (300) such that they are supplied with current in succession (Fig. 15).

With respect to claim 8, Pong further discloses the transformer (300) has a central tap at the secondary side, to which tap the common cathode of the two LEDs or two groups of LEDs (320, 325) (Fig. 15).

With respect to claim 9, Pong further discloses a further LED (335) is connected as a main light source between the central tap and the common cathode or anode of the two LEDs or two groups of LEDs (320, 325) that serve as subsidiary light sources (Fig. 15).

With respect to claim 10, Pong does not disclose a switching diode being used instead of one of the subsidiary light source LEDs (335). However, this difference is not of patentable merits since the switching diode has been commonly practiced in the art as its controlling current flow in one direction, and therefore, configuring such a switching diode in lieu of one of the subsidiary LEDs upon a desired application or environment of use would have been deemed obvious to a person skilled in the art.

With respect to claims 11-13, Pong does not specifically disclose that the colors of the two LEDs or two groups of LEDs (320, 325) and/or the subsidiary light source LEDs having a color in a manner claimed in claims 11-13. However, this difference is not of patentable merits since such a selection of color of the LEDs does not affect the operational capability of the power control of the Pong modified by Elferich apparatus with respect to the output power of its inverter. Therefore, to employ one of the two LEDs or two groups of LEDs (320, 325) and/or the subsidiary light source LEDs having a color in a manner claimed in claims 11-13 in the Pong modified by Elferich apparatus for an expected color output would have been deemed obvious to a person skilled in the art to produce many different colors of light by combining two or more different color light emitting diodes.



Re claim 17, Pong discloses an apparatus (Fig. 15), comprising:

a transformer (300) having a primary winding (305) and at least one secondary winding (310, 315) (Fig. 15);

at least one first light source (320, 325) coupled to the at least one secondary winding (310, 315) so as to conduct a first secondary current and thereby generate first light only during a positive half-cycle of a secondary voltage across the at least one secondary winding (310, 315) (Fig. 15);

at least one second light source (325, 320) coupled to the at least one secondary winding (315, 310) so as to conduct a second secondary current and thereby generate second light only during a negative half-cycle of the secondary voltage (Fig. 15);

a half or full bridge DC/AC converter with a control unit coupled to the primary winding (305) for providing at least one control signal having a variable duty cycle and a current through the primary winding (305) (Fig. 15; paragraphs [0064] – [0066]);

Pong does not disclose the half or full bridge DC/AC converter with the control unit being a resonance circuit with a controller for providing at least one control signal having a variable duty cycle to the resonance circuit and providing a resonance current through the primary winding, wherein: the resonance current is based at least in part on the variable duty cycle of the at least one control signal; and the variable duty cycle of the at least one control signal is based at least in part on at least one of a first feedback signal associated with the at least one first light source and a second feedback signal associated with the at least one second light source.

In the same field of endeavor, Elferich discloses a resonance circuit (14) with a controller (22) for providing at least one control signal (VA, VB) having a variable duty cycle to the resonance circuit (14) and providing a resonance current ( $I_c$ ) through the primary winding (LN) (Fig. 1), wherein: the resonance current ( $I_c$ ) is based at least in part on the variable duty cycle of the at least one control signal (i.e., output signal from controller 22); and the variable duty cycle of the at least one control signal is based at least in part on at least one of a first feedback signal (VB) associated with the at least one first load and a second feedback signal (VA) associated with the at least one second load (abstract; Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the half or full bridge DC/AC converter including the control unit of Pong with power converter including a resonant capacitor as taught by Elferich for the purpose of producing different voltages to drive different color LEDs using single resonant power converter having a resonance circuit with a controller for providing at least one control signal having a variable duty cycle to the resonance circuit and providing a resonance current through the primary winding, wherein: the resonance current is based at least in part on the variable duty cycle of the at least one control signal; and the variable duty cycle of the at least one control signal is based at least in part on at least one of a first feedback signal associated with the at least one first light source and a second feedback signal associated with the at least one second light source as taught by Elferich for no other reason than controlling at least one first light source and at least second light source simultaneously and independently.

With respect to claims 18 and 19, given Pong modified by Elferich apparatus, the first feedback signal and the second feedback signal being optical signals and/or the first feedback

signal comprises a first measured value of the first secondary current and the second feedback signal comprises a second measured value of the second secondary current would have been obvious since Elferich teaches such feature (Figs. 1, 9; abstract; paragraphs [0086] – [0090]).

With respect to claim 20, Pong further discloses the at least one first light source (320, 325) and the at least one second light source (325, 320) comprises a plurality of LEDs (paragraphs [0028], [0068]).

With respect to claim 21, Pong further discloses at least one third light source (335) coupled to the at least one secondary winding (310, 315) so as to conduct a third secondary current and thereby generate third light during both the positive half-cycle and negative half-cycle of the secondary voltage (Fig. 15; paragraph [0065]).

With respect to claims 22 and 23, although, Pong discloses a first to third different light sources for producing different colors (paragraphs [0002], [0025]), Pong does not specifically mention the third light source being a white LED or the first light sources being a red and second light source being a blue LED.

However, it is well known in the art to produce many different colors of light by combining two or more different color light emitting diodes.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the first to third light sources with red, blue and white LEDs, respectively, for no other reason than producing different desired colors for many different type lighting application and illumination.

***Response to Arguments***

10. Applicant's arguments with respect to claims 1, 4-13 and 17-26 have been considered but are moot in view of the new grounds of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ephrem Alemu whose telephone number is (571) 272-1818. The examiner can normally be reached on M-F Flex hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

10/27/2008

/Douglas W Owens/  
Supervisory Patent Examiner, Art Unit 2821  
October 27, 2008